

## PRELIMINARY RESULTS OF A HAIL REPORTING PROJECT

STAFF, Radar Analysis and Development Unit

U.S. Weather Bureau, Kansas City, Mo.

A special hail reporting survey was conducted during the period April 15 through June 15, 1963, in a four-county area of Oklahoma. The National Severe Storms Project (NSSP) provided financial and supplementary support and the Radar Analysis and Development Unit (RADU) did the analysis and data handling. A supply of hail reporting forms (fig. 1), instruction letters, location forms, and preaddressed envelopes was mailed to each box holder, star route patron, and rural route patron in the counties of Caddo, Grady, Stephens, and Jefferson. In all, 16,020 addresses were furnished reporting material.

During this period, which was marked by an unusually low rate of hail and severe weather, about 1,000 persons responded and submitted completed forms (fig. 2). If there had been an average amount of hail, the response would undoubtedly have been even greater. Many, having no hail to report, provided extremely detailed reports of precipitation (times and amounts), cloud covers and movements, and wind speeds and wind shifts. When hail was reported, many of the reports gave detailed

descriptions of the shape and color of the stones, and some observers sketched diagrams of the stones to amplify their remarks. It was heartwarming to see the gracious response of the many wonderful people who participated.

Analysis procedures required that the reporting sites be accurately located and this was accomplished by use of the "General Highway Map" for each county which is prepared by the Oklahoma Department of Highways Planning Division in cooperation with the U.S. Department of Commerce, Bureau of Public Roads. These maps indicate all roads, section lines, and prominent geographical features with the data on roads updated through January 1963. The culture features are updated through 1959-1961. The area was laid out in 10-mi. by 10-mi. squares with these squares cross gridded by alphabetical reference. Thus a two-letter designator locates any site within a 10-mi. square. Each 10-mi. square was further broken down into 1-mi. squares and referenced by a number 00-99 so that each site can be located within a 1-mi. square by use of a two-letter-two-number identifier (e.g.,

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MONTH		WB Form 614-13 3 - 63		U. S. DEPARTMENT OF COMMERCE Weather Bureau		LOCATION																				
1963		HAIL REPORTING FORM (Use reverse for remarks)										COUNTY				NAME										
DATE	NO STORM OBSERVED	KIND OF STORM (Check)				TIME OF STORM				IF ANY HAIL, REPORT FOLLOWING:								INTENSITY OF RAIN (Check)			THUNDER HEARD					
		Hail Only	Hail & Rain	Rain Only	Thunder (No Precip.)	Rain		Hail		Size of Hail (Check smallest and largest size)				Color of Hail (Check)		Shape of Hail (Check)										
						BEGAN	ENDED	BEGAN	ENDED	1/4"	1/2"	3/4"	1"	1 1/2"	2"	3"	Clear	Milky	All White	Round	Flat	Irreg- ular	Light	Mod- erate	Heavy	
SUNDAY																										
DATE																										
MONDAY																										
DATE																										
SATURDAY																										
DATE																										

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FIGURE 1.—Form distributed to residents in a 4-county area of Oklahoma for reporting the occurrence of hail and storms. Almost 1000 persons responded.

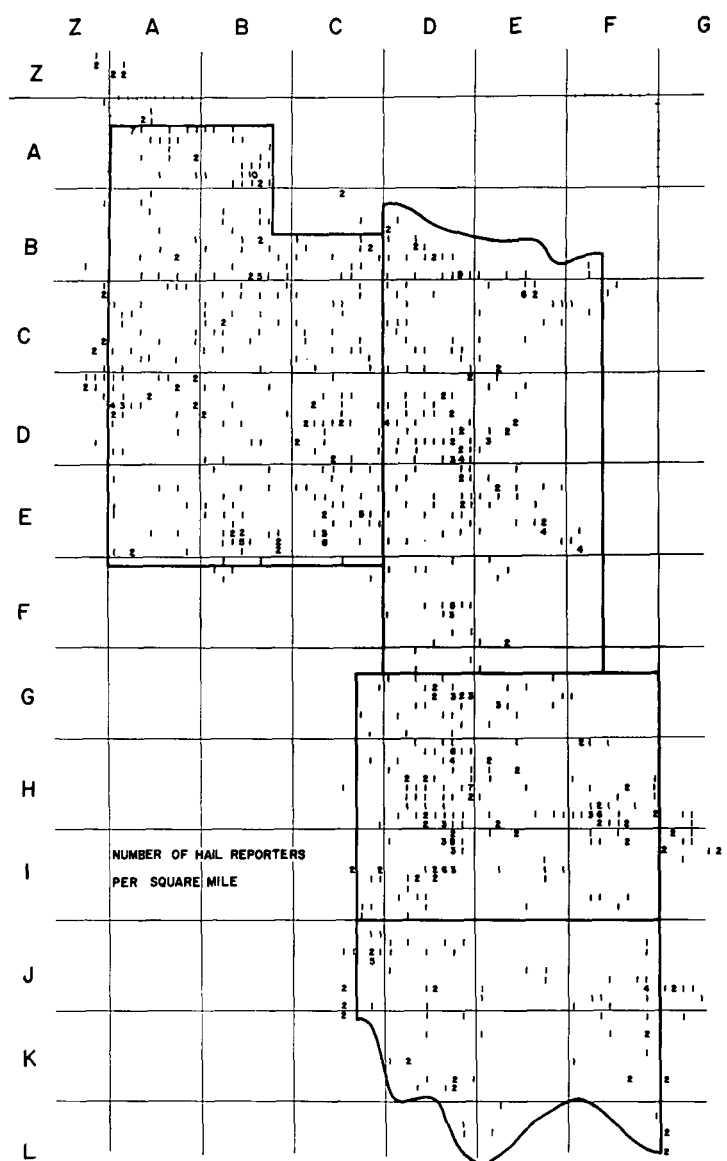


FIGURE 2.—Locations in the four counties of persons who took part in hail reporting project.

AB45). From the original location forms it was generally possible to position the site in the proper 1-mi. square and many times to the actual culture feature within the square. A master list of names and location identifiers was prepared for each county, and as the weekly reporting forms were received each form was labeled with an appropriate identifier.

The dates have been extracted for hail occurrences. It was found that hail was reported by one or more sites on 21 days during the 56-day period. A few of these

appear to be a result of misdating the event, occurring as a single report in an area which had numerous reports on the preceding or following day. Of these 21 days, 5 days had 50 or more reports, and one of these, April 17, had 140 reports. A total of 305 reports of hail of maximum size  $\frac{1}{2}$  in. or greater was distributed as follows:

Size (in.)	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	$\geq 3$
No. of reports	164	52	50	17	10	12

Many reports of "severe wind", "tornadic winds", "very strong winds", etc., were noted, four of which described the specific wind damage. Two reports of tornadoes were cited.

Thus, during the period, there were 141 reports of hail  $\frac{1}{4}$  in. or larger, four specific reports of wind damage, and two reports of tornadoes; all these reports meet or exceed the definition of severe local storms.

A check was made of the severe weather record kept by the Severe Local Storms Forecast Unit (SELS), which logs, on a day-to-day basis, all reports of severe weather received at the operational desk either by teletypewriter or by direct telephone report. It is interesting to note that in the four-county area during the entire 8-week period, not a single report of severe weather was received by SELS through the normal communications channels. There were occasions when severe weather was reported within Oklahoma but outside the four counties. Although some of these storm systems did move through the area of interest, no reports were received from the area itself at the operations desk.

A breakdown of these data shows 11 cases of hail of size  $\frac{3}{4}$  in. or greater reported in the special network with no reports from Oklahoma in the SELS log; 10 cases of large hail in the area with the SELS log showing severe weather reported in Oklahoma outside the network; and 9 cases with no severe weather reported within the network but with reports of severe weather elsewhere within the State recorded in the SELS log.

A great deal of analysis remains to be accomplished on these hail data. However, from the preliminary statistics, one fact stands out rather clearly: In all types of weather verification, both forecast and research, we are required to verify on reports received; hail reports show how misleading this practice can be, and that when one correlates any forecast or new research or operational technique with observations, the results may be very misleading. One of the major aims of this study was to attempt to determine a "correction factor" for such verification studies, but the lack of statistics on actual reports (none) made this impossible. The indicated trend is, as has been suspected, that normal reporting procedures give a low estimate of severe storm occurrences.

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